

REMARKS

The present application was filed on July 26, 2001 with claims 1-22. Claims 1-22 remain pending in the application. Claims 1 and 19 are the independent claims.

Claims 1-5, 7-12 and 14-22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,772,333 (hereinafter “Brendel”) in view of U.S. Patent No. 5,774,668 (hereinafter “Choquier”) and in further view of U.S. Patent No. 6,138,120 (hereinafter “Gongwer”).

Claims 6 and 13 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Brendel, Choquier and Gongwer in view of U.S. Patent No. 6,611,498 (hereinafter “Baker”).

Applicants respectfully request reconsideration of the present application in view of the remarks below.

Independent claim 1 is directed to a method of load balancing messages to servers of a server farm. The method includes the step of configuring the load balancer with information specifying a pre-assignment of different groups of session ID values to respective ones of the servers, with each of the servers being operative to assign session ID values from its associated one of the pre-assigned groups to sessions handled by that server. The method further includes the steps of the load balancer determining, for at least some client messages including a non-empty session ID field, which server or sub-group of servers is associated with the ID in the ID field, responsive to the configured information, and the load balancer selecting a server to receive each of the at least some client messages, at least partially responsive to the determination.

The recited method of claim 1 solves a serious problem of the prior art. For example, in establishing secure communication between a client and a server using the secure sockets layer (SSL) protocol, the server assigns a session ID to a negotiated session. This session ID is stored by the server for a predetermined time after the termination of the session. A client can establish an SSL connection based on a previously-negotiated session for which the session ID has been stored by the server, by transmitting an SSL “client hello” message to the server along with the session ID of the previously-negotiated session. This ability to establish SSL connections using previously-negotiated session IDs is referred to as SSL persistency. See the specification at page 1, line 19, to page 2, line 8. The problem arises because a conventional load balancer, in order to ensure SSL

persistency, must forward any “client hello” messages from a single client to the same server that negotiated the session ID. The way that the conventional load balancer does this is by storing lists of session IDs with respective server identifiers. This is problematic because of the large amount of storage space needed to store the session IDs with the respective server identifiers. Also, searching and managing large lists of session IDs negatively impacts the performance of the load balancer. See the specification at page 2, lines 13-32.

It is important to note that the Brendel reference cited by the Examiner suffers from the very same problem described above, and therefore teaches directly away from the claimed invention. That is, Brendel teaches an arrangement in which a load balancer must store session IDs with respective server identifiers. This is apparent from, for example, the abstract of Brendel, which states that a load balancer “stores the SSL session ID along with a server assignment that identifies the server that generated the SSL session ID” and for subsequent requests from the same client “uses the SSL session ID to send the requests to the same server.” Thus, a load balancer configured in accordance with the techniques described in Brendel will suffer from the excessive storage space problem and its related negative performance impact as described in the specification at page 2, lines 13-32.

The arrangement recited in claim 1 overcomes this serious disadvantage of Brendel and other conventional load balancers by configuring the load balancer with information specifying a pre-assignment of different groups of session ID values to respective ones of the servers, with each of the servers being operative to assign session ID values from its associated one of the pre-assigned groups to sessions handled by that server. Thus, a given server can only assign session IDs from its assigned group of session ID values. With reference to the illustrative embodiment of FIG. 1, load balancer 104 includes a table 130 which lists ranges of SSL session IDs assigned to respective ones of the servers 102. Each of the servers 102 includes a record 132 which identifies the particular range of SSL session IDs that may be assigned by the server to SSL sessions. See the specification at, for example, page 6, lines 1-14. By pre-assigning groups of session ID values to particular servers, the load balancer is more easily able to determine which client messages should be sent to which servers. This advantageously avoids the excessive storage requirements and negative

performance impacts that are associated with Brendel and other conventional load balancers that simply store session IDs with individual server identifiers, without placing any limit on which session IDs can be assigned by which servers.

The Examiner acknowledges that Brendel fails to meet the limitations of claim 1, but argues that the Choquier and Gongwer references supply the missing teachings. More specifically, the Examiner argues that Choquier and Gongwer collectively disclose the limitation of claim 1 which calls for configuring the load balancer with information specifying a pre-assignment of different groups of session ID values to respective ones of the servers, with each of the servers being operative to assign session ID values from its associated one of the pre-assigned groups to sessions handled by that server. We respectfully disagree with the assertion of the Examiner. In arguing that the above limitation is met by Choquier and Gongwer, the Examiner relies on the teachings in column 15, lines 28-41 of Choquier and column 2, lines 2-5, column 9, lines 52-54, and column 12, lines 54-57 and 62-65 of Gongwer.

The relied-upon teachings from Choquier relate to use of “a randomization technique in selecting a server.” See column 15, lines 22-23. Such random server selection is not only directly contrary to the claimed invention, but clearly inapplicable to the Brendel approach in which the load balancer stores for each SSL session ID a server assignment that identifies the server that generated the SSL session ID. In other words, because Brendel must direct subsequent requests from a given client to the server that previously generated a session ID for that client, Brendel cannot utilize random server selection of the type described in Choquier. To do so would make the Brendel approach unworkable, which is strong evidence that those skilled in the art would not be motivated to make the proposed combination.

The relied-upon teachings from Gongwer fail to supplement the fundamental deficiencies of Brendel and Choquier as identified above. For example, Gongwer in column 9, lines 52-54, refers to assignment of “a new session handle from the pool of unassigned session handles.” However, this is nothing more than what is done in conventional practice as described in the background portion of the specification at page 1, lines 29-30. What is not taught by the collective teachings of Gongwer, Choquier and Brendel is the limitation at issue in which a load balancer is configured with

information specifying a pre-assignment of different groups of session ID values to respective servers, with each of the servers being operative to assign session ID values from its associated one of the pre-assigned groups to sessions handled by that server.

Accordingly, the collective teachings of the applied references fail to meet the limitations of claim 1, and there is no motivation for the proposed combination in view of the clear teachings away in both Brendel and Choquier.

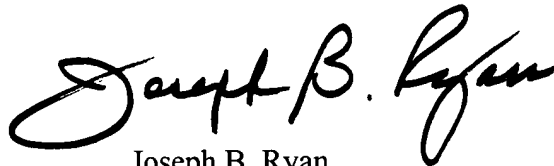
Independent claim 19 is believed allowable for reasons similar to those identified above in the context of independent claim 1.

The dependent claims 2-18 and 20-22 are believed allowable for at least the reasons identified above with regard to their respective independent claims, and are believed to define additional patentable subject matter relative to the cited references.

In view of the above, Applicants believe that claims 1-22 are in condition for allowance, and respectfully request withdrawal of the §103(a) rejections.

As indicated previously, a Notice of Appeal is submitted concurrently herewith.

Respectfully submitted,

A handwritten signature in black ink, reading "Joseph B. Ryan". The signature is fluid and cursive, with the first name "Joseph" and last name "Ryan" clearly legible.

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Enclosure(s): Notice of Appeal